

# Taking Stock of the Scientific Literature on Interdisciplinary Teaching and Learning in the Humanities, Arts, and Social Sciences

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**Abstract:** Interdisciplinary teaching and learning (ITL) are prevailing trends among K-12 educational practitioners and policymakers. However the empirical scholarship on ITL in K-12 settings has never been systematically reviewed. In this paper, we review the empirical literature on K-12 ITL within the humanities, social sciences, and arts, asking how ITL is understood and implemented in peer-reviewed research articles. We examine how existing scholarship on ITL diverges in its definition of interdisciplinarity; processes for designing and implementing ITL; and scholarly objectives that the study of ITL is meant to accomplish.

## Introduction

Interdisciplinary, multidisciplinary, and transdisciplinary teaching and learning (ITL) – sometimes referred to as cross-curricular teaching and learning, and curricular integration – have been prevalent in K-12 settings for over a century (Grossman et al., 2000). As part of a government-led effort, our research team conducted a study of ITL in the humanities in K-12 contexts. Our goal in this poster is to take stock of the ways in which K-12 ITL in the humanities, social sciences, and arts, has been understood, implemented, and studied within educational research. This goal is achieved by means of a systematic review of all the relevant academic literature available.

## Research questions

We address three primary research questions: (1) How is K-12 ITL defined? (2) How are K-12 ITL curricula designed and implemented? (3) Why has K-12 ITL been studied?

## Method

### Search procedure, strategy, and eligibility

We conducted two database searches for all articles on K-12 ITL in the humanities, arts, and social sciences, in June 2020 and June 2022, respectively. Search #1 was conducted on the following databases: ERIC, Education fulltext, APA Psycinfo, Web of Science, and SCOPUS. Search #2 was conducted only on Web of Science. Our search strategy consisted of two groups of keywords and search terms: (1) any publication with the words *interdisciplinary*, *multidisciplinary*, *transdisciplinary*, *cross curricular*, or *curricular integration* (2) that presented empirical findings from K-12 educational contexts. These searches yielded a total of 9565 titles; abstracts were screened with the online program Covidence©. This first round of screening identified 894 articles, which we downloaded and read. Finding that the rigor, quality, or relevance of many of the studies reported in these articles was low, we adopted the following inclusion criteria: (1) Journal Impact Factor was reported for the year of publication on *Journal Citation Reports*; (2) An empirical investigation of ITL in a K-12 setting was central to the study; (3) The article had a robust methods section; (4) Articles that focused exclusively on STEM or CLIL were excluded; (5) In cases of more than one publication per study, we chose a single representative paper. This left us with a total of 85 articles that were included in the review.

## Findings

### How is K-12 ITL defined?

How does interdisciplinary knowledge differ from disciplinary knowledge? We used a grounded coding approach to distinguish between four definitions of interdisciplinary knowledge: (1) *Expanding disciplinary boundaries*: For example, by involving students as more active participants, drama can help extend their ways of engaging with other fields, such as geometry (Duartepe-Paksu & Ubuz, 2009); (2) *Multiple disciplinary perspectives on a single issue*: For instance, Didonato (2013) recounts how one group of students that was interested in dinosaurs chose to design a new wing for the natural history museum. Their project required science to research the

dinosaurs, mathematics to calculate the required dimensions of the space, and geography to determine how to group the different exhibits; (3) *Knowledge underlying the disciplines*: For example, secondary students in Hong Kong learn liberal studies, to “enable students to develop a critical mind and a broad perspective [...] construct knowledge and acquire skills for lifelong learning, such as communication and problem-solving skills, and develop positive values and attitudes toward life” (Kwok, 2014); and (4) *Creating a new discipline*: For instance, Condon and Wichowsky (2018) argued that combining science and civics can mediate the emergence of citizen-scientists, promoting the utilization of science towards civic efficacy in relation to community.

### How are K-12 ITL curricula designed and implemented?

Of the ITL curricula that were investigated in these articles, 15.6% (n=13) were explicitly described as government initiatives, and 6% (n=5) of the articles noted that the curricula were initiated by the participating schools. A total of 26.5% (n=22) of the articles noted that the curricula were co-designed by researchers and teachers (e.g., Walsh & Cordero, 2019), 22.9% (n=19) specified that they were designed by researchers (e.g., Viñas et al., 2022), 32.5% (n=27) were designed by teachers (e.g., Helstad & Lund, 2012), and 2.4% (n=2) were designed by preservice teachers within the context of their training. Although our findings indicated that most of the ITL curricula under investigation were designed locally by teachers and/or researchers, 19.3% (n=16) of the articles specified that their design was aligned with a well-known standardized curriculum. Moreover, 7.2% (n=6) of the ITL units were designed in consultation with experts (e.g., Lu et al., 2022), and 15.7% (n=13) were designed iteratively, meaning that they included a pilot study and/or feedback from teachers and other stakeholders during the design phase (e.g., Finch et al., 2021).

### Why has K-12 ITL been studied?

Our grounded analysis yielded six distinct research foci: (1) Interdisciplinary Knowledge; (2) Disciplinary Knowledge; (3) Implementation of an educational innovation; (4) Student participation and growth; (5) Teacher knowledge and reasoning; (6) Teacher collaboration. Most studies we reviewed pursued several objectives, represented by multiple research questions.

### Discussion and conclusion

As it currently stands, the body of scholarship on K-12 ITL in the humanities, social sciences, and arts demonstrates wide variability among researchers. This variability holds promise and peril. Its promise lies in the fact that ITL can be broadly applied to different contexts, in various ways, and in pursuit of multiple educational and scholarly goals. However, this very same variability is also ITL’s greatest weakness. Given its ability to capture so much, it risks being a construct with little inherent and unique meaning of its own. Overcoming this challenge requires scholars to bring diverse perspectives into dialogue and establish a cohesive framework that will guide future research endeavors.

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